



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,624	06/24/2003	Kazuto Ikemoto	396.42871X00	1111

20457 7590 05/13/2005

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

WEBB, GREGORY E

ART UNIT PAPER NUMBER

1751

DATE MAILED: 05/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/601,624

Applicant(s)

IKEMOTO ET AL.

Examiner

Gregory E. Webb

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikemoto (US6372410).

Concerning the claimed fluorine compound, Ikemoto teaches the following:

The fluorine compounds usable in the present invention are hydrofluoric acid, ammonium fluorides and amine hydrofluorides including ammonium fluoride, acid ammonium fluoride, methylamine hydrofluoride, ethylamine

Art Unit: 1751

hydrofluoride, propylamine hydrofluoride, tetramethylammonium fluoride, tetraethylammonium fluoride, ethanolamine hydrofluoride, methylethanolamine hydrofluoride, dimethylethanolamine hydrofluoride, hydroxylamine hydrofluoride, dimethylhydroxylamine hydrofluoride, triethylenediamine hydrofluoride, etc. Of these fluorine compounds, ammonium fluoride and tetramethylammonium fluoride are preferred, and ammonium fluoride is more preferred. These fluorine compounds may be used alone or in combination of two or more.(see col. 4, lines 7-29)

Concerning the claimed amide solvent, Ikemoto teaches the following:

As the rinsing solutions, there may be used water-soluble organic solvents such as methyl alcohol, ethyl alcohol, isopropanol, dimethylacetamide, dimethylsulfoxide (DMSO), glycol ethers and ethanolamine, or a mixed solvent composed of any of the above water-soluble organic solvents and ultrapure water. Also, ultrapure water may be used alone as the rinsing solution. The removal of the resist residues using the resist stripping composition of the present invention is sufficiently completed without deposition of the fluorine compound even by the rinsing with the water-soluble organic solvent alone.(see col. 5, lines 1-10)

Concerning the claimed ether solvent, Ikemoto teaches the following:

7. The resist stripping composition according to claim 5, wherein said at least one glycol ether is selected from the group consisting of diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, diethylene

Art Unit: 1751

glycol dimethyl ether, triethylene glycol monomethyl ether, and
dipropylene glycol monomethyl ether.(see claim 7).

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe (US6323169).

Concerning the claimed fluorine compound, Abe teaches the following:

The water-soluble fluorine compounds (c) usable in the present invention
may include organic amine fluorides such as ammonium fluoride, acid
ammonium fluoride and monoethanolamine fluoride, and tetramethyl ammonium
fluoride. The concentration of the water-soluble fluorine compound is
preferably 0.001 to 10% by weight, more preferably 0.005 to 5% by weight
based on the total weight of the stripping composition.(see col. 3, lines 35-45)

Concerning the claimed amide solvent, Abe teaches the following:

12. The aqueous resist stripping composition according to claim 2, wherein
said organic solvent is at least one solvent selected from the group
consisting of ethylene glycol monoethyl ether, ethylene glycol monobutyl
ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl
ether, diethylene glycol monobutyl ether, propylene glycol monomethyl
ether, propylene glycol monoethyl ether, propylene glycol monobutyl ether,
dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether,
dipropylene glycol monobutyl ether, diethylene glycol dimethyl ether,
dipropylene glycol dimethyl ether, formamide, monomethylformamide,
dimethylformamide, monoethylformamide, diethylformamide, acetamide,
monoethylacetamide, dimethylacetamide, monoethylacetamide,

Art Unit: 1751

diethylacetamide, N-methylpyrrolidone, N-ethylpyrrolidone, dimethyl sulfoxide, dimethyl sulfone, diethyl sulfone, bis(2-hydroxy) sulfone and tetramethylene sulfone.(see claim 12)

Concerning the claimed ether solvent, Abe teaches the following:

The organic solvents (d) usable in the present invention may include ether solvents such as ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, propylene glycol monomethyl ether, propylene glycol monoethyl ether, propylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether, dipropylene glycol monobutyl ether, diethylene glycol dimethyl ether and dipropylene glycol dimethyl ether; amide solvents such as formamide, monomethylformamide, dimethylformamide, monoethylformamide, diethylformamide, acetamide, monoethylacetamide, dimethylacetamide, monoethylacetamide, diethylacetamide, N-methylpyrrolidone and N-ethylpyrrolidone; and sulfur compound solvents such as dimethyl sulfoxide, dimethyl sulfone, diethyl sulfone, bis(2-hydroxy) sulfone and tetramethylene sulfone. Preferred are dimethyl sulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether and dipropylene glycol monobutyl ether.(see col. 3, lines 46-68).

Art Unit: 1751

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Gotoh (US6265309).

Concerning the claimed fluorine compound, Gotoh teaches the following:

The first to third cleaning agents of the present invention contain a fluorine-containing compound as the component (A). Examples of the fluorine-containing compound may include hydrofluoric acid, ammonium fluoride, ammonium hydrogenfluoride, acidic ammonium fluoride, methylamine salt of hydrogen fluoride, ethylamine salt of hydrogen fluoride, propylamine salt of hydrogen fluoride, tetramethylammonium fluoride, etc.

These may be used alone or in combination of two or more as the component (A).(see cols. 7-8)

Concerning the claimed amide solvent and the claimed ether solvent, Gotoh teaches the following:

8. The cleaning agent according to claim 1, wherein the water-soluble organic solvent is at least one compound selected from the group consisting of formamide, N-methylformamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, .gamma.-butyrolactone, methanol, ethanol, isopropyl alcohol, ethylene glycol, methyl acetate, ethyl acetate, butyl acetate, methyl lactate, ethyl lactate, ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, dimethylsulfoxide and sulfolane.(see claim 8).

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Gotoh (US6514352).

Art Unit: 1751

Concerning the claimed fluorine compound, Gotoh teaches the following:

The fluorine compound used in the present invention includes, for example, organic amine fluorides such as ammonium fluoride, acidic ammonium fluoride, monoethanolamine fluoride, methylamine hydrogenfluoride, ethylamine hydrogenfluoride and propylamine hydrogenfluoride, tetramethylammonium fluoride and tetraethylammonium fluoride. Ammonium fluoride and tetramethylammonium fluoride are preferred. These fluorine compounds have a content of usually 0.001 to 20% by weight, preferably 0.005 to 10% by weight based on the cleaning agent. If the fluorine compound has a content of less than 0.001% by weight, the speed for removing the resist, the cured resist layer and the etching residue is reduced. On the other hand, if it exceeds 20% by weight, corrosion of the wiring material and the insulating layer is accelerated.(see col. 4, lines 51-65)

Concerning the claimed amide solvent and the claimed ether solvent, Gotoh teaches the following:

The cleaning agent used in the present invention may contain, if necessary, an organic solvent, and it includes, for example, ether base solvents such as ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, propylene glycol monomethyl ether, propylene glycol monoethyl ether, propylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether,

Art Unit: 1751

dipropylene glycol monobutyl ether, diethylene glycol dimethyl ether and dipropylene glycol dimethyl ether; amide base solvents such as formamide, monomethyl-formamide, dimethylformamide, monoethylformamide, diethylformamide, acetamide, monomethylacetamide, N-methylpyrrolidone, N-ethylpyrrolidone, N,N-dimethyl-formamide and N,N-dimethylacetamide; and sulfur compound base solvents such as dimethylsulfoxide, dimethylsulfone, diethylsulfone, bis(2-hydroxysulfone) and tetramethylenesulfone.(see col. 5, lines 1-16)

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Maruyama (US5962385).

Concerning the claimed fluorine compound, Maruyama teaches the following:

13. A cleaning liquid according to claim 3, wherein the fluorine compound is selected from the group consisting of ammonium fluoride, a hydrogen fluoride salt of methylamine, a hydrogen fluoride salt of ethylamine, a hydrogen fluoride salt of propylamine, tetramethylammonium fluoride and tetraethylammonium fluoride.(see claim 13)

Concerning the claimed amide solvent and the claimed ether solvent, Maruyama teaches the following:

14. A cleaning liquid according to claim 13, wherein the organic solvent is at least one organic solvent selected from the group consisting of formamide, monomethylformamide, dimethylformamide, acetamide, methylacetamide, dimethylacetamide, N-methylpyrrolidone, ethylene glycol

Art Unit: 1751

monomethyl ether, diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, sulfolane and dimethylsulfoxide.(see claim 14)

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Torii (US5972862).

Concerning the claimed fluorine compound, Torii teaches the following:

A fluorine-containing compound is used as the component (A) in the cleaning liquids of the present invention, which compound is exemplified by hydrofluoric acid, ammonium fluoride, ammonium hydrogen fluoride and ammonium borofluoride.(see col. 4, lines 45-50)

Concerning the claimed amide solvent and the claimed ether solvent, Torii teaches the following:

A water-soluble or water-miscible organic solvent is used each as the component (B) in the cleaning liquids of the invention. Examples of such organic solvent include amides such as formamide; N-methylformide; N,N-dimethylformide; N,N-dimethylacetamide; and N-methylpyrrolidone, lactones such as γ -butyrolactone alcohols such as methanol; ethanol; isopropanol; and ethylene glycol, esters such as methyl acetate, ethyl acetate, butyl acetate, methyl lactate, and ethyl lactate, glycols such as ethylene glycol monobutyl ether, diethylene glycol monomethyl ether and diethylene glycol monoethyl ether, and sulfur compounds such as dimethyl sulfoxide and sulfolane.(see cols. 4-5).

Art Unit: 1751

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe (US5792274).

Concerning the claimed fluorine compound, Tanabe teaches various exemplified compositions containing ammonium fluoride (see table 1).

Concerning the claimed amide solvent and the claimed ether solvent, Tanabe teaches the following:

Any organic solvent may be used as component (b) in the present invention, as long as it is miscible with components (a), (c), and (d). Water-soluble organic solvents used in conventional organic amine-based remover solution compositions may be used. Examples of the water-soluble organic solvents include sulfoxides (e.g., dimethyl sulfoxide), sulfones (e.g., dimethyl sulfone, diethyl sulfone, bis(2-hydroxyethyl) sulfone, tetramethylene sulfone), amides (e.g., N,N-dimethylformamide, N-methylformamide, N,N-dimethylacetamide, N-methylacetamide, N,N-diethylacetamide), lactams (e.g., N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, N-propyl-2-pyrrolidone, N-hydroxymethyl-2-pyrrolidone, N-hydroxyethyl-2-pyrrolidone), imidazolidinones (e.g., 1,3-dimethyl-2-imidazolidinone, 1,3-diethyl-2-imidazolidinone, 1,3-diisopropyl-2-imidazolidinone), lactones (e.g., gamma.-butyrolactone, delta.-valerolactone), and polyhydric alcohols (e.g., ethylene glycol, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether acetate, diethylene glycol, diethylene

Art Unit: 1751

glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether); and derivatives thereof. Among these, preferred are dimethyl sulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone, ethylene glycol, and diethylene glycol monobutyl ether, because these solvents bring about the removability of modified resist films. In particular, use of a water-soluble organic solvent comprising at least 10% by weight (wt %) ethylene glycol as component (b) is preferred in that the composition of the present invention containing this component (b) is highly inhibited from corroding a metal deposition substrate in the removing of a holed resist pattern. In this case, ethylene glycol alone may be used as component (b) because the higher the ethylene glycol content, the higher the anticorrosive effect. A mixture of 40 to 60 wt % of ethylene glycol and 60 to 40 wt % of dimethyl sulfoxide is also advantageous.(see col. 4)

Allowable Subject Matter

No allowable claims were found. Nor was allowable subject matter found in the specification.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

Art Unit: 1751

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'G. Webb', with a large, stylized initial 'G'.

Gregory E. Webb
Primary Examiner
Art Unit 1751

gew